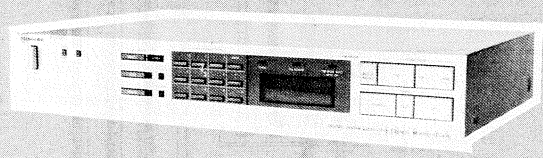
SERVICE DATA
FILE NO. 170-183

TOSHIBA

DIGITAL SYNTHESIZER STEREO TUNER

ST-S30L



SPECIFICATIONS

■ General Data

Power supply:	220V ∿ 50 Hz
Power consumption:	13W
Dimensions:	W420 x H72 x D280mm
Weight:	2.9 kg

■ Tuner

Frequency range	FM:	87.5 ∿ 108 MHz (0.05 MHz step)
	MW:	531 ∿ 1602 kHz (9 kHz step)
	LW:	153 ∿ 281 kHz (1 kHz step)
Memory:		10 channels
Functions:		Manual tuning, auto tuning, direct tuning

■ FM Tuner Section

Sensitivity:	0.7μV (75Ω) (DIN)
Harmonic distortion:	MONO 0.12% (DIN)
	STEREO 0.2% (DIN)
SN ratio:	MONO 68 dB (DIN-C)
	STEREO 66 dB (DIN-C)
Frequency response:	30 ∿ 15,000 Hz $^{+0.2}_{-2.5}$ dB
Sensitivity (IHF):	70 dB (±300 kHz) (DIN)
Image rejection:	40 dB
IF rejection:	100 dB
Capture ratio:	2.5 dB
Spurious response:	75 dB
AM suppression:	65 dB
Stereo separation:	50 dB (at 1 kHz) (DIN)
Output:	600 mV

■ AM Tuner Section

	MW	LW
Sensitivity (S/N 20 dB):	400μV/m (10μV)	700μV/m (10μV)
Selectivity:	25 dB	35 dB
Image rejection:	40 dB	70 dB
S/N:	50 dB	50 dB

■ Clock Section

Clock display:	24 hour clock
Time setting interval:	From 1 min to 23 hrs 59 min

Specifications are subject to change without notice.

TE, FR
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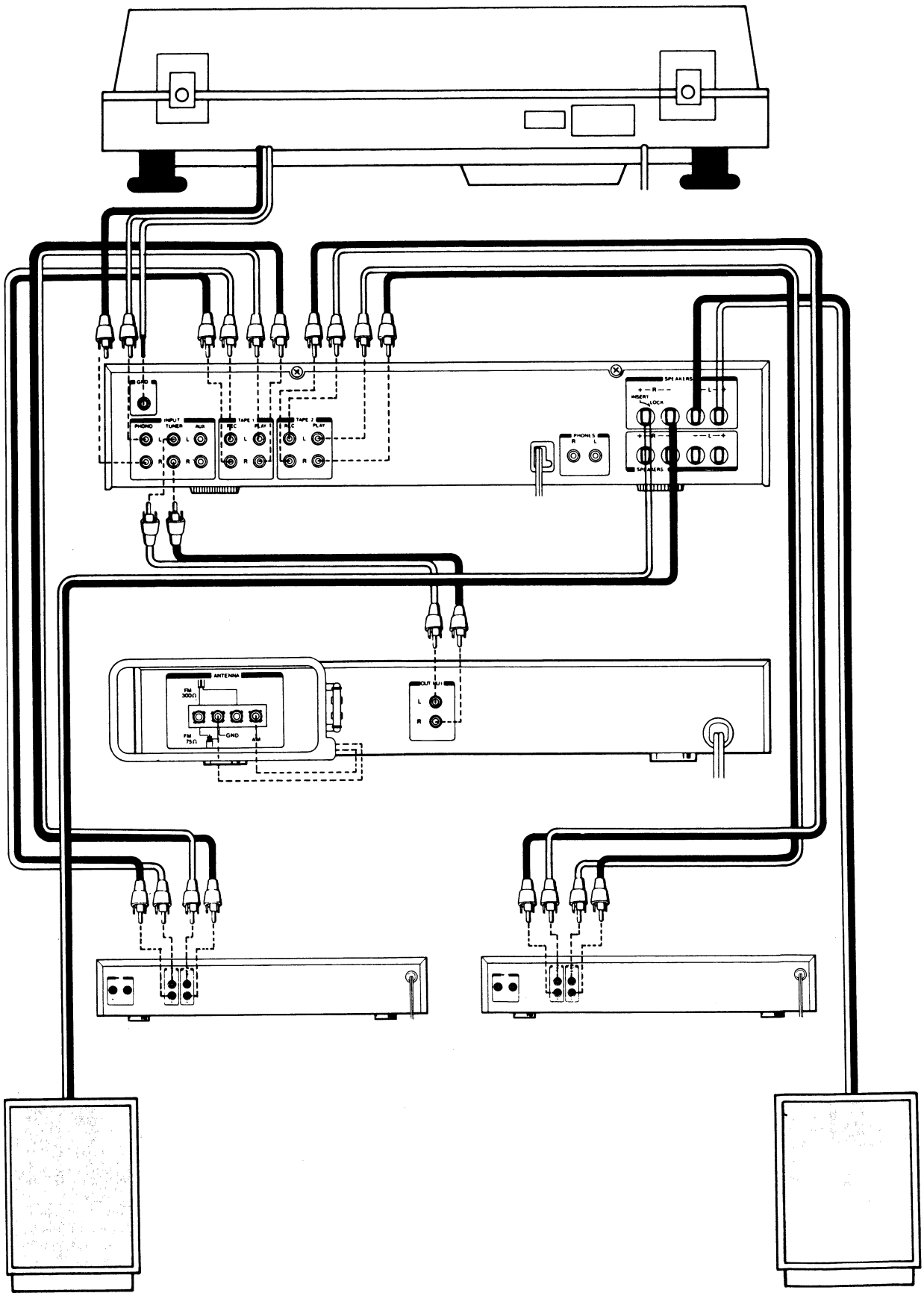
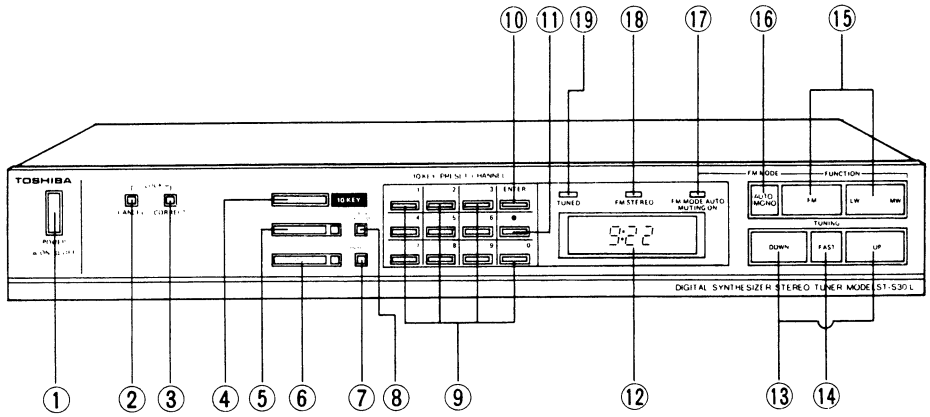
1. SYSTEM CONNECTIONS



2. FRONT PANEL FACILITIES



① **POWER switch**
Depress this switch once to turn power on and once more to switch the unit to the stand-by mode. When the power switch is turned on, the frequency that was tuned in when the unit was switched to the stand-by mode will appear in the display.

② **CANCEL button**
Press to cancel the time reset mode or the direct tuning mode and return to the previously tuned frequency.

③ **CORRECT button**
Press to set the unit to the present time reset mode so that the present time can be entered with the numeric keys. (The word 'CORRECT' is displayed.)

④ **DIRECT button**
Press this button while listening to a radio broadcast to set the unit to the direct tuning mode so that the frequency of the desired station can be entered with the numeric keys. (The word 'DIRECT' is displayed.)

⑤ **AUTO button**
Press to set the unit to the auto tuning mode. (The indicator in the button lights.)
Automatic tuning is not possible on the LW band.

⑥ **MANUAL button**
Press to set the unit to the manual tuning mode. (The indicator in the button lights.)

⑦ **MEMORY button**
Use this button when placing frequencies in the memory (preset channels '1' to '0'). Press this button ('ME' appears in the display) and then one of the preset channel buttons to place the currently tuned frequency in that channel. If no preset channel button is pressed, the 'ME' display goes out after about 5 seconds.

⑧ **DISPLAY TIME/FRQ button**
Use this button to switch between the frequency and time display modes.

⑨ **10 KEY/PRESET CHANNEL buttons**
Use these buttons to:
(1) Enter the present time.
(2) Perform direct tuning.
(3) Preset a frequency.
(4) Recall a preset frequency. (The frequency and number of the depressed button are displayed.)

⑩ **ENTER button**
Press this button to:
(1) Tune in the frequency you have just entered with the numeric keys.
(2) Activate the clock function after entering the present time with the numeric keys.

⑪ **• button**
Use this button to enter the decimal point for the direct tuning mode.

⑫ **Display**
Shows the tuned frequency and the present time.

⑬ **UP/DOWN TUNING buttons**
Auto tuning
When the UP or DOWN button is pressed, the frequency automatically increases or decreases until the next station of sufficient signal strength is reached.

Manual tuning
Each time the UP or DOWN button is pressed, the tuned frequency increases or decreases in the following manner.
FM: 0.05 MHz steps
MW: 9 kHz steps
LW: 1 kHz steps

If either button is held down more than half a second, the tuned frequency will continue to increase or decrease until the button is released.

⑭ **FAST button**
In the manual tuning mode, press this button along with the UP or DOWN button to rapidly increase or decrease the tuned frequency. Pressing this button in the auto tuning mode will not change the scanning speed.

⑮ **FUNCTION buttons**
FM: for FM broadcasts
LW: for LW broadcasts
MW: for MW broadcasts

⑯ **FM MODE button**
Press this button to activate FM mode auto tuning and muting (indicator lights). In this mode, reception is automatically switched between stereo and mono for FM broadcasts and the muting circuit operates to suppress interstation noise when scanning the dial. (Muting operates for AM (LW/MW) broadcasts as well as FM.) Press this button again to cancel FM mode auto tuning (indicator goes out). In this mode, even stereo broadcasts will be heard in mono and muting will not operate.

⑰ **FM MODE AUTO MUTING ON indicator**

⑱ **STEREO indicator**
Lights when an FM stereo broadcast is being received.

3. OPERATIONS

First, press the FM or AM (LW/MW) function button

■ Auto Tuning

1. Press the AUTO button ⑤ .
2. Press the UP or DOWN ⑬ button. The frequency will automatically increase or decrease until a station of sufficient strength is reached. To stop the frequency before such a station is reached, press the manual button ⑥ .

Note: Automatic tuning is not possible on the LW band.

■ Manual Tuning

1. Press the MANUAL button ⑥ .
2. Press the UP or DOWN button ⑬ to tune in the desired frequency. The tuned frequency changes in 0.05 MHz steps in the FM band, 9 kHz in the MW band and 1 kHz in the LW band. Hold either button down to continuously increase or decrease the tuned frequency.

■ Direct Tuning

1. Press the DIRECT button ④ .
2. Enter the desired frequency with the numeric keys ⑨ .
3. Press the ENTER button ⑩ to tune in that frequency.

Notes:

- The word "ERROR" is displayed if the entered frequency is outside the selected band.
- If the entered frequency does not exactly match the tuning step frequencies, the nearest tuning step frequency immediately below the entered frequency will be tuned. For example, if FM 100.11 MHz is entered, 100.10 MHz will be tuned.
- Press the CANCEL button ② before the ENTER button is pressed to cancel the direct tuning mode.
- If you make a mistake when entering the frequency, press the DIRECT button ④ again and reenter the frequency.

■ Preset Tuning

The ST-S30L is equipped with a preset tuning function that stores the exact frequencies of up to ten stations. Once a station has been stored in the memory, it can be recalled in an instant by pressing the corresponding preset channel button. Old stations can be replaced with new ones any number of times by simply storing the new frequency where the old one was stored. Perform the following procedure to store a station in one of the preset channels.

1. Tune in the desired station.
2. Press the MEMORY button ⑦ .
3. Press the preset channel button ⑨ of the channel where the station is to be stored.

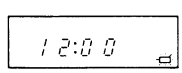
Up to ten frequencies can be stored in this manner for instant recall at any time. Note that only one frequency can be stored by each preset channel button.

4. TIME ADJUSTMENT

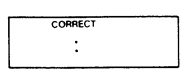
1. Press the DISPLAY TIME/FRQ button ⑧ to switch the display to the time mode. (The display is always in the time mode when the unit is in the stand-by mode.)
2. Press the CORRECT button ③.
3. Enter the present time with the numeric keys ⑨.
4. Press the ENTER button ⑩ .

Example: to set 8:15 AM.

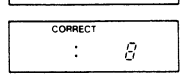
(a) Press the DISPLAY TIME/FRQ button ⑧. Display flashes on and off.



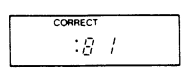
(b) Press the CORRECT button ③.



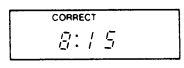
(c) Press the '8' key.



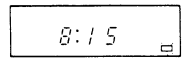
(d) Press the '1' key.



(e) Press the '5' key.



(f) Press the ENTER button ⑩



Note:
This unit uses a 24 hour display.

5. DISASSEMBLY INSTRUCTIONS

TOP COVER REMOVAL

1. Remove six screws Ⓐ (3ϕ x 6mm), Ⓑ (3ϕ x 6mm) and Ⓒ (3ϕ x 6mm), and the top cover can be removed from the unit. (See Figure 1, 2 and 3)

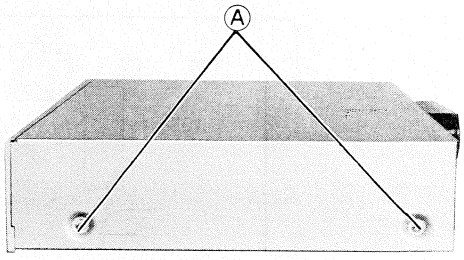


Figure 1

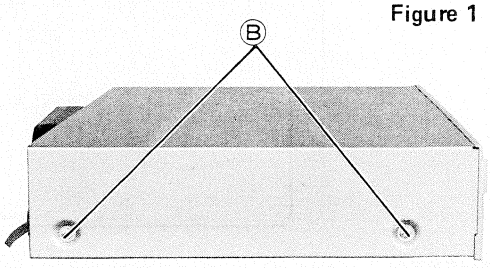


Figure 2

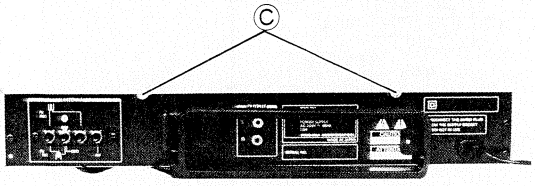


Figure 3

FRONT PANEL REMOVAL

1. Remove the top cover. (See Figure 1, 2 and 3)
2. Remove six screws Ⓓ (3ϕ x 8mm) and Ⓔ (3ϕ x 8mm), and the front panel can be removed from the unit. (See Figure 4 and 5)

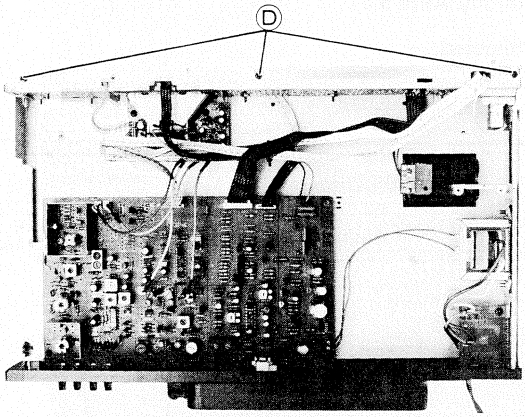


Figure 4

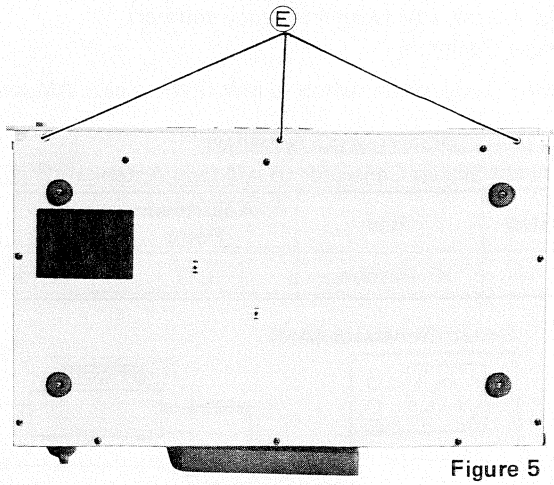
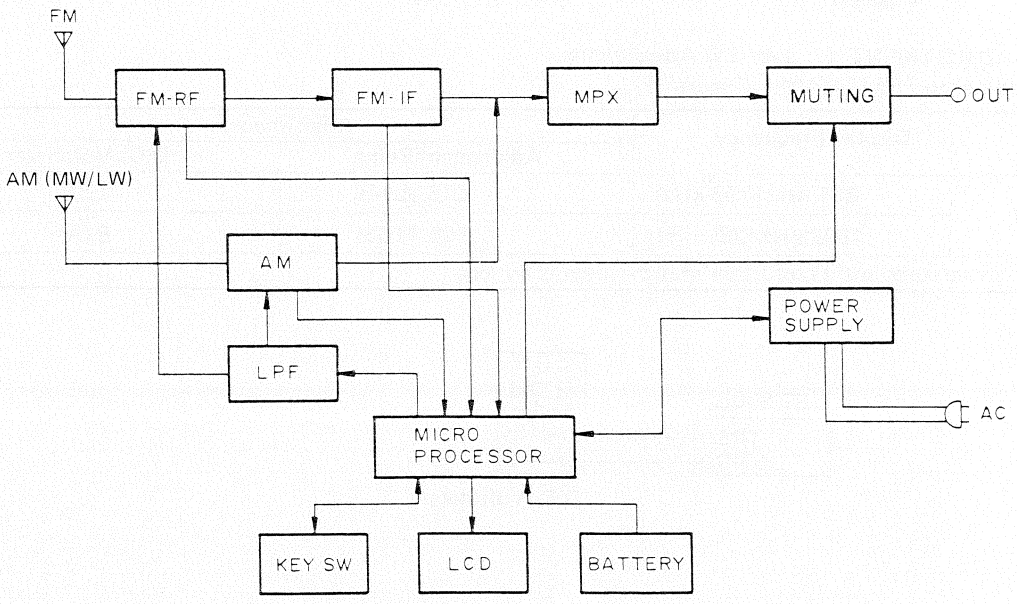
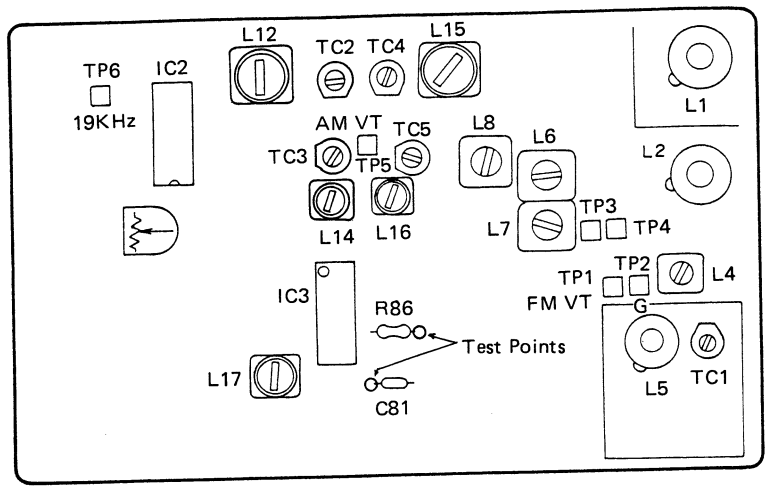


Figure 5

6. BLOCK DIAGRAM



7. ADJUSTMENTS



AM ADJUSTMENTS

Test equipement/Tools required

1. Signal Generator (with frequency counter)
2. Sweep Generator
3. Voltmeter
4. Oscilloscope
5. Adjustment Screwdriver
6. Dummy Antenna

Remarks: Set function switch to MW (LW). Leave AM loop antenna connected.

AM IF RESPONSE ADJUSTMENT

Connect Sweep Generator to AM loop Antenna. (Figure 6)

Step	Item	Adjustment Point	Adjustment
1	IF Response	L17	Adjust the scope pattern with marker (455 kHz) as illustrated in Figure 7.

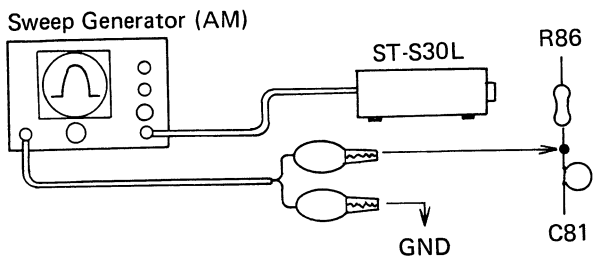


Figure 6

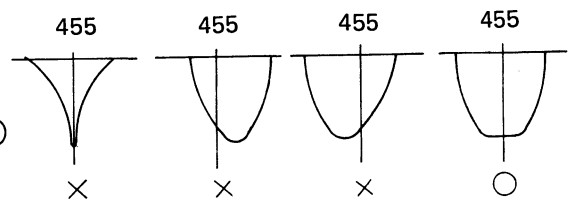


Figure 7

AM (MW/LW) VT ADJUSTMENT ( ) are LW Adjustments.

Connect D.C. Voltmeter to TP5 (AM VT). (Figure 8)

Step	Item	Display Frequency	Adjustment	
			Adjustment Point	D.C. Voltmeter
2	AM VT	531 kHz (153 kHz)	L16 (L14)	1.5V
3		1602 kHz (281 kHz)	TC5 (TC3)	8.0V
4	Repeat above steps untill no further improvement is noticed.			

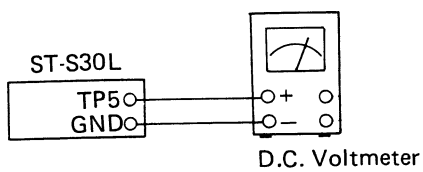


Figure 8

AM (MW/LW) TRACKING ADJUSTMENT ( ) are LW Adjustments.

Connect Signal Generator (S.G.) to AM Antenna Teriminal, and A.C. Voltmeter to OUTPUT Terminal. (Figure 9)

Step	Item	S.G. Setting	Display Frequency	Adjustment	
				Adjustment Point	A.C. Voltmeter
5	Tracking	603 kHz (162 kHz) 400 Hz 30% mod.	603 kHz (162 kHz)	L15 (L12)	MAXIMUM
6		1404 kHz (270 kHz) 400 Hz 30% mod.	1404 kHz (270 kHz)	TC4 (TC2)	MAXIMUM
7	Repeat above steps untill no further improvement is noticed.				

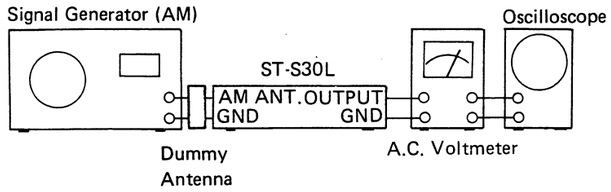


Figure 9

FM ADJUSTMENTS

Test equipments/Tolls required
1. Signal Generator
2. Stereo Modulator
3. Voltmeter
4. Distortion Meter
5. Oscilloscope
6. Frequency Counter
7. Adjustment Screwdriver
8. Network

Remarks: Set function switch to FM.

FM VT ADJUSTMENT

Connect DC Voltmeter across TP1 (FM VT) and TP2 (GND). (Figure 10)

Step	Item	Mode	Display Frequency	Adjustment	
				Adjustment Point	D.C. Voltmeter
1	FM VT	AUTO	87.5 MHz	L5	2.5V
2			108.0 MHz	TC1	8.0V
3	Repeat above steps untill no further improvement is noticed.				

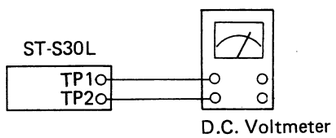


Figure 10

FM TRACKING ADJUSTMENT

Connect Signal Generator to FM Antenna Terminal (300Ω), and A.C. Voltmeter to OUTPUT Terminal. (Figure 11)

Step	Item	Input Setting	Mode	Display Frequency	Adjustment	
					Adjustment Point	A.C. Voltmeter
4	Tracking	98.1 MHz 1 kHz ± 75 kHz dev.	MONO	98.1 MHz	L1, 2	MAXIMUM

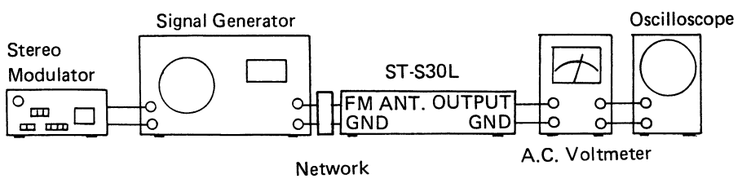


Figure 11

FM DISCRIMINATOR ADJUSTMENT 1

Connect DC Voltmeter across TP3 and TP4. (Figure 12)

Step	Item	Input Setting	Mode	Display Frequency	Adjustment	
					Adjustment Point	D.C. Voltmeter
5	Discrimi-nater	98.1 MHz 1 kHz ±75 kHz dev. 60 dB (ANT. Input)	MONO	98.1 MHz	L6	0V

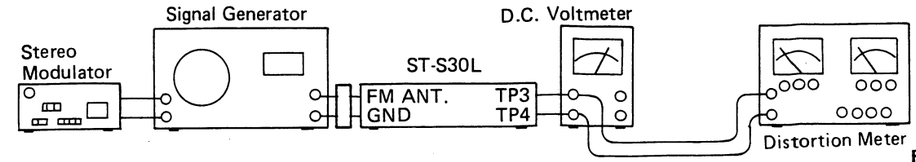


Figure 12

FM DISCRIMINATOR ADJUSTMENT 2

Connect A.C. Voltmeter and Distortion Meter to OUTPUT Terminal. (Figure 12)

Step	Item	Input Setting	Mode	Diaplay Frequency	Adjustment	
					Adjustment Point	Distortion Meter
6	Discrimi-nater	98.1 MHz 1 kHz ±75 kHz dev. 60 dB (ANT Input)	MONO	98.1 MHz	L7	MINIMUM

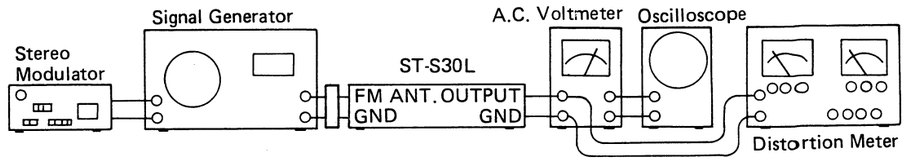


Figure 13

FM VCO ADJUSTMENT

Connect frequency counter to TP6 through 100 kΩ. (Figure 14)

Step	Item	Input Setting	Mode	Display Frequency	Adjustment	
					Adjustment Point	Frequency Counter
7	VCO	98.1 MHz 0 dev. 60 dB (ANT Input)	AUTO	98.1 MHz	VR1	19 kHz

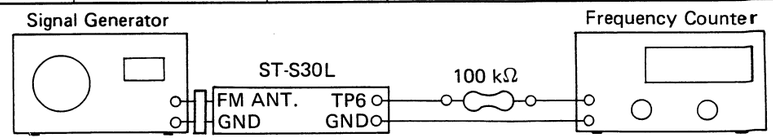


Figure 14

FM STEREO DISTORTION ADJUSTMENT

Connect distortion meter to OUTPUT terminal. Adjust the distortion of Lch (Rch) output, setting stereo modulator switch to Lch (Rch). (Figure 15)

Step	Item	Input Setting	Mode	Display Frequency	Adjustment	
					Adjustment Point	Distortion Meter
8	Stereo Distortion	98.1 MHz 1 kHz ± 68.25 kHz dev. 60 dB (ANT. Input)	AUTO	98.1 MHz	L4	MINIMUM

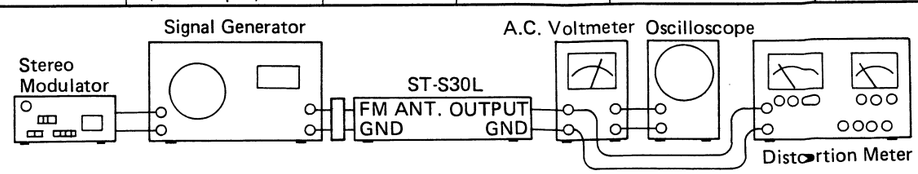
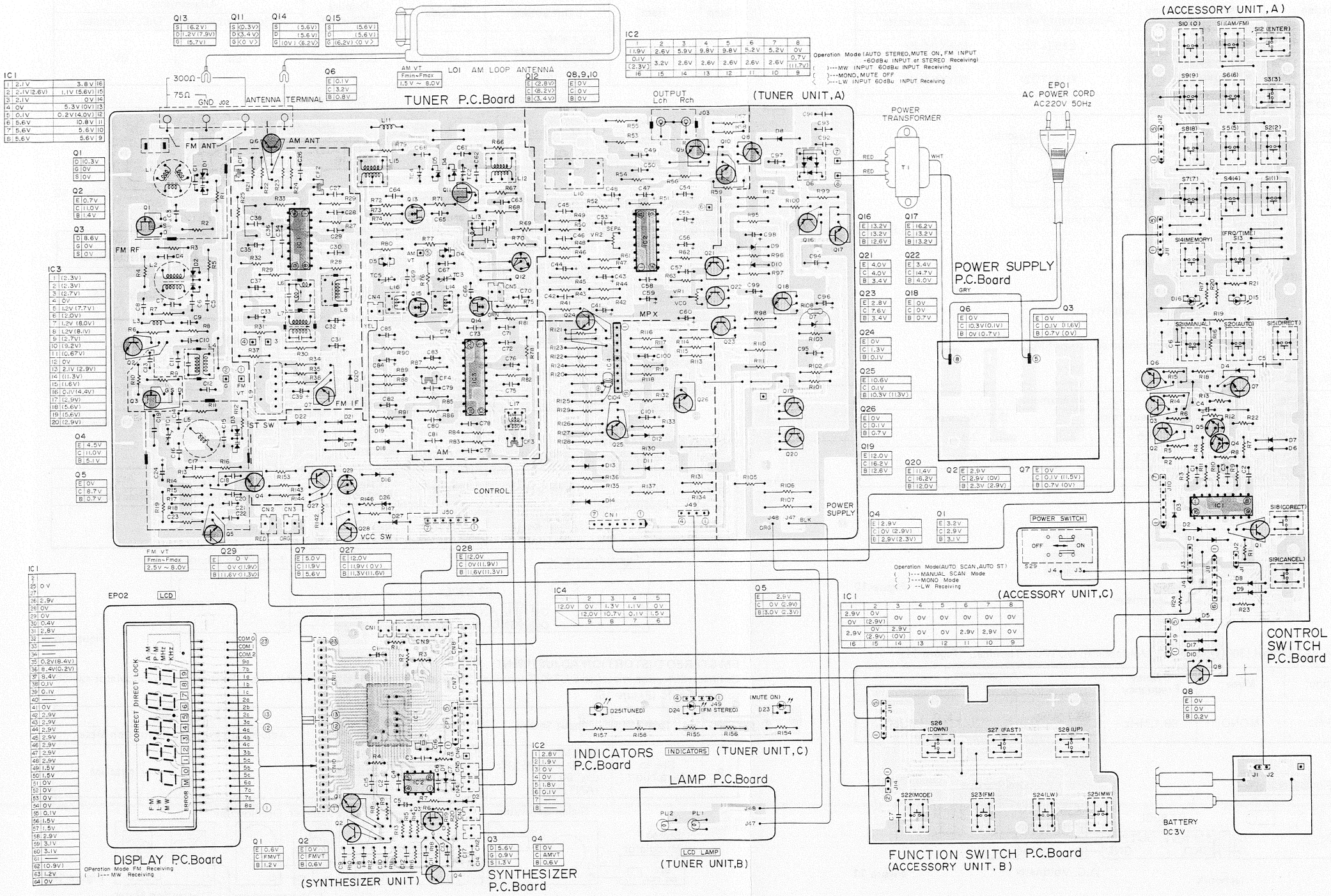
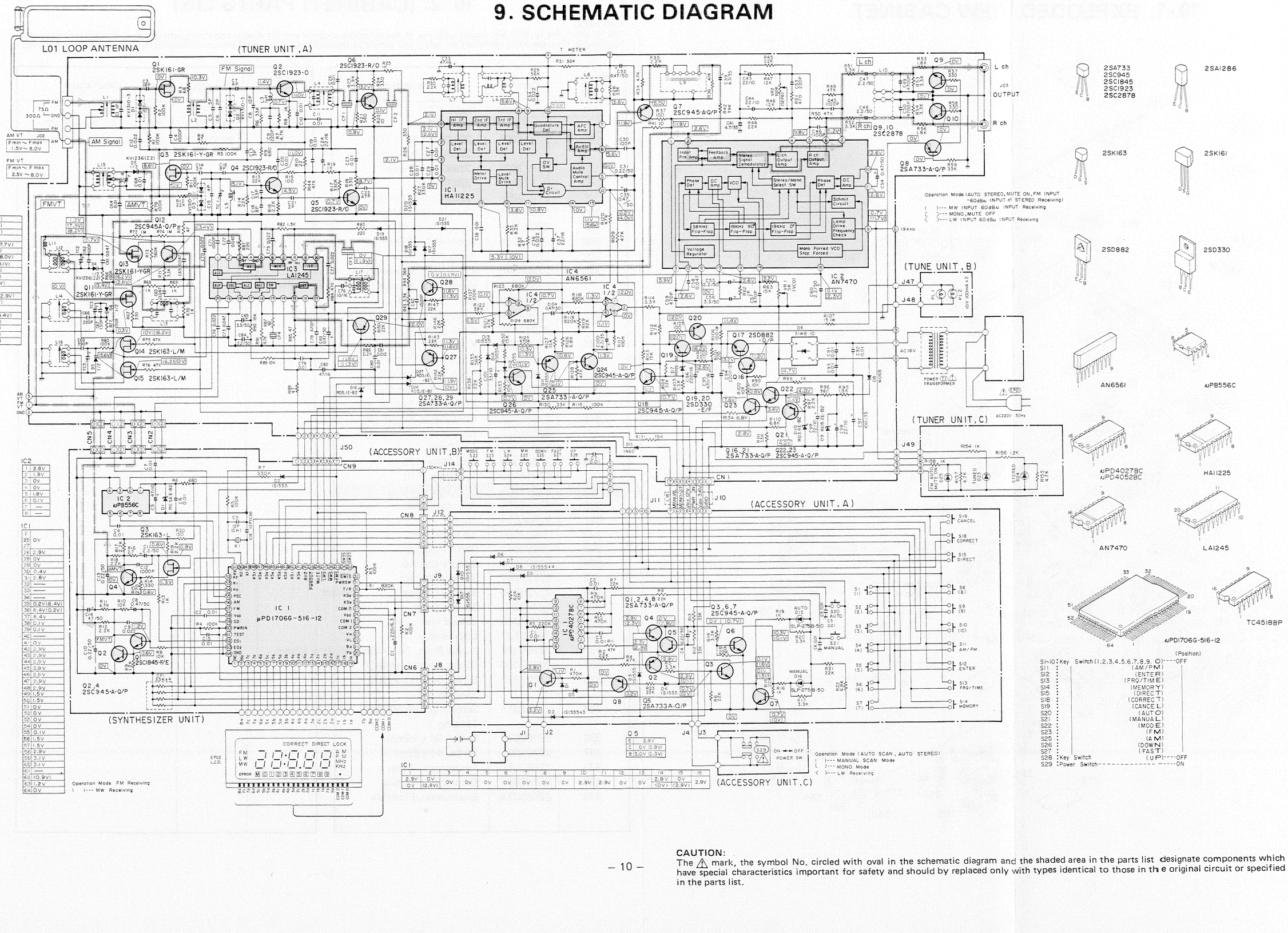


Figure 15

8. ELECTRICAL PARTS LOCATIONS

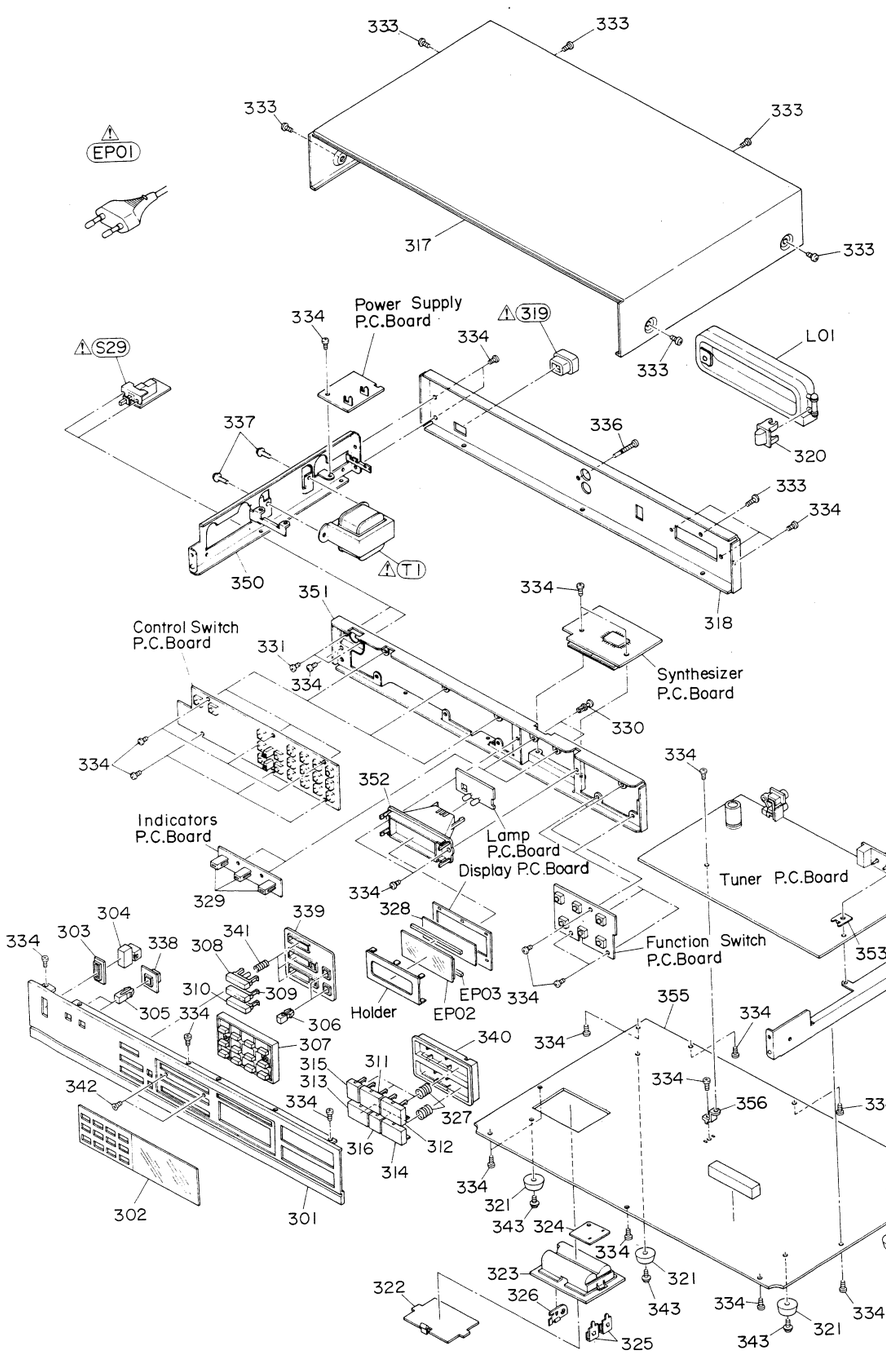


9. SCHEMATIC DIAGRAM



CAUTION:
The ⚠ mark, the symbol No. circled with oval in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should by replaced only with types identical to those in the original circuit or specified in the parts list.

10-1. EXPLODED VIEW CABINET



10-2. (CABINET) PARTS LIST

CAUTION:
The ⚠ mark, the symbol No. circled with oval in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should by replaced only with types identical to those in the original circuit or specified in the parts list.

Symbol No.	Part No.	Description
301	22825240	Panel (TE)
	22825308	Panel (FR)
302	22838208	Decoration Plate (TE)
	22838209	Decoration Plate (FR)
303	22883067	Escutcheon, Power
304	22824460	Knob, Power
305	22884324	Knob, Cancel/Correct
306	22884325	Knob, Display/Memory
307	22826419	Knob, Preset, 10 Key
308	22884326	Knob Ass'y, Direct
309	22884327	Knob Ass'y, Auto
310	22884328	Knob Ass'y, Manual (TE)
	22884418	Knob Ass'y, Manuel (FR)
311	22884329	Knob Ass'y, FM
312	22884405	Knob Ass'y, MW/LW (TE)
	22884419	Knob Ass'y, PO/GO (FR)
313	22884331	Knob Ass'y, Down (TE)
	22884420	Knob Ass'y, Retour (FR)
314	22884332	Knob Ass'y, Up (TE)
	22884421	Knob Ass'y, Avance (FR)
315	22884333	Knob Ass'y, Auto/Mono
316	22884334	Knob Ass'y, Fast (TE)
	22884422	Knob Ass'y, Rapide (FR)
317	22841394	Top Cover
318	22841392	Jack Plate (TE)
	22841400	Jack Plate (FR)
⚠ 319	25848041	Cord Bush
320	22757121	Antenna Holder
321	22828094	Foot
322	22882080	Battery Cover
323	22882081	Battery Holder
324	22725258	Battery Contact
325	22725259	Battery Contact
326	22725260	Battery Contact
327	22777292	Spring, Knob
328	20857033	Color Filter
329	22757122	LED Holder
330	22705020	Plastic Rivet, 3ϕ x 4.5mm
331	22707066	Screw, 3ϕ x 6mm, BID
333	22707812	Screw, 3ϕ x 8mm, BID Tapping
334	22707911	Screw, 3ϕ x 8mm, BID Tapping
336	22708059	Screw, 3ϕ x 19mm
337	22707371	Screw, 4ϕ x 8mm
338	22883071	Escutcheon, Timer
339	22883072	Escutcheon, Tuning
340	22883073	Escutcheon, Function

Symbol No.	Part No.	Description
341	25777327	Spring, Knob
342	22707304	Screw, 3ϕ x 7mm, FLT
343	22701436	Screw, 3ϕ x 8mm, TPAN

11. PARTS LIST

CAUTION:
The ⚠ mark, the symbol No. circled with oval in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should by replaced only with types identical to those in the original circuit or specified in the parts list.

Symbol No.	Part No.	Description
IC'S, TRANSISTORS & DIODES		
TUNER UNIT		
Q1	A6042640	Transistor, 2SK161-GR
Q2	A6319020	Transistor, 2SC1923-O
Q3	A6042630	Transistor, 2SK161-Y/GR
Q4, 5, 6	A6319060	Transistor, 2SC1923-R/O
Q7	22114768	Transistor, 2SC945A-Q/P
Q8	22117250	Transistor, 2SA733A-Q/P
Q9, 10	A6342200	Transistor, 2SC2878-A/B
Q12	22114768	Transistor, 2SC945A-Q/P
Q11, 13	A6042630	Transistor, 2SK161-Y/GR
Q14, 15	22117302	Transistor, 2SK163-L/M
Q16	22117250	Transistor, 2SA733A-Q/P
Q17	22117248	Transistor, 2SD882-Q/P
Q18	22114768	Transistor, 2SC945A-Q/P
Q19, 20	22117268	Transistor, 2SD330-E/F
Q21	22117250	Transistor, 2SA733A-Q/P
Q22, 23 24	22114768	Transistor, 2SC945A-Q/P
Q25	22117250	Transistor, 2SA733A-Q/P
Q26	22114768	Transistor, 2SC945A-Q/P
Q27, 28 29	22117250	Transistor, 2SA733A-Q/P
IC1	22114689	IC, HA11225
IC2	22117275	IC, AN7470
IC3	22117276	IC, LA1245
IC4	22117273	IC, AN6561
D1, 2, 3	22115888	Diode, KV1310-3
D4, 5	22115848	Diode, KV1236-Z2
⚠ D6	22115631	Diode, S1WB10
D7	22115755	Diode, RD12E-B2
D8	22115894	Diode, W06B
D9	22115910	Diode, RD8.2E-B2
D10	22115957	Diode, RD3.9E-B2
D11, 12 13, 14	A7246703	Diode, 1S1555V
D15	22115808	Diode, 1K60A
D16	22115518	Diode, RD5.1E-B2
D17, 18 19, 20 21	A7246703	Diode, 1S1555V
D23, 25	22115912	Diode, SLP-251B-50, LED
D24	22115913	Diode, SLP-151B-50, LED
D26, 27	22115518	Diode, RD5.1E-B2

Symbol No.	Part No.	Description
SYNTHESIZER UNIT		
Q1	22117262	Transistor, 2SC1845-F/E
Q2	22114768	Transistor, 2SC945A-Q/P
Q3	22117286	Transistor, 2SK163-L
Q4	22114768	Transistor, 2SC945A-Q/P
IC1	22117343	IC, μPD1706G-516-12
IC2	22117288	IC, μPB556C
D1	22115909	Diode, RD3.6E-B2
D2	A7246703	Diode, 1S1555V
ACCESSORY UNIT		
Q1, 2	22114206	Transistor, 2SA733A-Q/P
Q3	22114589	Transistor, 2SC945A-Q/P
Q4, 5	22114206	Transistor, 2SA733A-Q/P
Q6, 7	22114589	Transistor, 2SC945A-Q/P
Q8	22114206	Transistor, 2SA733A-Q/P
IC1	22117283	IC, μPD4027BC
D1, 2, 3, 4, 5, 6, 7, 8, 9, 10	A7246703	Diode, 1S1555V
D15, 16	22115895	Diode, SLP-275B-50
D17	A7246703	Diode, 1S1555V
COILS & TRANSFORMERS		
L01	22242982	Coil, LOOP Antenna
TUNER UNIT		
L1	22294497	Coil, FM RF
L2	22294498	Coil, FM RF
L3	22232285	Coil, Choke, 1μH
L4	22265865	IF Transformer, FM
L5	22295162	Coil, FM Oscillator

Symbol No.	Part No.	Description
L6	22265866	IF Transformer, FM
L7	22265867	IF Transformer, FM
L8	22212066	Coil, Peaking, 120 kHz
L9	22135059	LC Filter, Band-pass
L10	22135060	LC Filter
L11	22232285	Coil, Choke, 1μH
L12	22245457	Coil, LW RF
L13	22135072	LC Filter, Low-pass
L14	22245458	Coil, MW Oscillator
L15	22245447	Coil, MW RF
L16	22245448	Coil, MW Oscillator
L17	22264895	IF Transformer, AM
⚠ T1	22224287	Transformer, Power

ELECTRICAL PARTS

⚠ EP01	22167286	Power Cord
EP02	22104604	L.C.D. (Display)
EP03	22751213	Rubber Contact (Display)

TUNER UNIT

PL1, 2	22113596	Lamp, 10V, 100mA
CF1	22153300	Ceramic Filter, MS3GH15-A
CF2	22153301	Ceramic Filter, MJGH15-A
CF3	22153303	Ceramic Filter
CF4	22153304	Ceramic Filter
J02	22162521	Terminal, 4P, Antenna
J03	22198050	Jack, 2P, Output

SYNTHESIZER UNIT

CP1	22130723	Composite Part
X1	22153305	Crystal, 150 kHz

ACCESSORY UNIT

S1, 2, 3	22196327	Key Switch, 1, 2, 3
S4, 5, 6		Key Switch, 4, 5, 6
S7, 8, 9		Key Switch, 7, 8, 9
S10, 11, 12		Key Switch, 0, am/pm, ENTER
S13, 14, 15		Key Switch, FQ/TIME, MEMORY, DIRECT
S18, 19, 20		Key Switch, CORRECT, CANCEL,AUTO
S21, 22, 23		Key Switch, MANUAL, MODE, FM
S24, 25, 26		Key Switch, LW, MW, DOWN
S27, 28		Key Switch, FAST, UP
⚠ S29	22196328	Push Switch, Power

CAPACITORS

C = ±0.25pF, D = ±0.5pF, J = ±5%, K = ±10%, M = ±20%, Z = −20 + 80%

ABBREVIATIONS: CD = Ceramic Disk, EL = Electrolytic, MY = Mylar, BL = Barrier Layer, PS = Polystyrene

TUNER UNIT

TC1	22309209	Trimmer, 7pF
TC2, 3	22309218	Trimmer
TC4, 5	22309210	Trimmer, 20pF
C1	22361109	CD, 1pF, 50V, C
C3	22361180	CD, 18pF, 50V, J
C4	22349102	CD, 1000pF, 50V, K
C5	22361509	CD, 5pF, 50V, C
C6	22361209	CD, 2pF, 50V, C
C7	22361409	CD, 4pF, 50V, C
C8	22361120	CD, 12pF, 50V, J
C9	22362221	CD, 220pF, 50V, J
C10, 11	22342103	CD, 0.01mfd, 50V, Z
C12	22342223	CD, 0.022mfd, 50V, Z
C13	22361309	CD, 3pF, 50V, C
C14	22361209	CD, 2pF, 50V, C
C15	22360706	CD, 4pF, 50V, C, UJ
C16	22361809	CD, 8pF, 50V, D
C17	22361330	CD, 33pF, 50V, J
C18	22361809	CD, 8pF, 50V, D
C19, 20	22360604	BL, 0.01mfd, 25V, M
C21	22361209	CD, 2pF, 50V, C
C22	22361470	CD, 47pF, 50V, J
C23	22360604	BL, 0.01mfd, 25V, M
C24	22485220	EL, 22mfd, 16V
C26, 27	22342103	CD, 0.01mfd, 50V, Z
C28, 29	22342103	CD, 0.01mfd, 50V, Z
C30	22362101	CD, 100pF, 50V, J
C31	22488228	EL, 0.22mfd, 50V
C32	22488478	EL, 0.47mfd, 50V
C33	22445470	EL, 47mfd, 16V

Symbol No.	Part No.	Description
C34	22360223	BL, 0.022mfd, 16V, M
C35	22488478	EL, 0.47mfd, 50V
C36	22360223	BL, 0.022mfd, 16V, M
C37	22443220	EL, 22mfd, 10V
C38	22342103	CD, 0.01mfd, 50V, Z
C39	22447479	EL, 4.7mfd, 35V
C41	22488479	EL, 4.7mfd, 35V
C42	22372152	MY, 1500pF, 50V, J
C43, 44	22443220	EL, 22mfd, 10V
C45, 46	22371122	MY, 1100pF, 50V, J
C47, 48	22488229	EL, 2.2mfd, 50V
C49, 50	22371472	MY, 4700pF, 50V, J
C53	22362221	CD, 220pF, 50V, J
C54	22488478	EL, 0.47mfd, 50V
C55	22488229	EL, 2.2mfd, 50V
C56	22488339	EL, 3.3mfd, 50V
C57	22381471	PS, 470pF, 50V, J
C58	22371473	MY, 0.047mfd, 50V, J
C59	22349471	CD, 470pF, 50V, K
C60	22488229	EL, 2.2mfd, 50V
C61	22342473	CD, 0.047mfd, 50V, Z
C62	22362101	CD, 100pF, 50V, J
C63	22342473	CD, 0.047mfd, 50V, Z
C64	22342103	CD, 0.01mfd, 50V, Z
C65	22342473	CD, 0.047mfd, 50V, Z
C66	22381221	PS, 220pF, 50V, J
C67	22362151	CD, 150pF, 50V, J
C68	22342103	CD, 0.01mfd, 50V, Z
C69	22381391	PS, 390pF, 50V, J
C70	22342223	CD, 0.022mfd, 50V, Z
C71	22349102	CD, 1000pF, 50V, K
C72, 73	22342473	CD, 0.047mfd, 50V, Z
C74	22360606	BL, 0.022mfd, 16V, N
C75	22342223	CD, 0.022mfd, 50V, Z
C76	22485100	EL, 10mfd, 16V
C77	22342223	CD, 0.022mfd, 50V, Z
C78	22349471	CD, 470pF, 50V, K
C79	22371103	MY, 0.01mfd, 50V, J
C80	22342103	CD, 0.01mfd, 50V, Z
C81	22371103	MY, 0.01mfd, 50V, J
C82	22485470	EL, 47mfd, 16V
C83	22488478	EL, 0.47mfd, 50V
C84	22488229	EL, 2.2mfd, 50V
C85	22488339	EL, 3.3mfd, 50V
C91, 92	22342103	CD, 0.01mfd, 50V, Z
C93	22342103	CD, 0.01mfd, 50V, Z
C94	22446222	EL, 2200mfd, 25V
C95	22485471	EL, 470mfd, 16V
C96	22485221	EL, 220mfd, 16V
C97	22487101	EL, 100mfd, 35V
C98, 99	22443220	EL, 22mfd, 10V
C100	22447479	EL, 4.7mfd, 35V
C101	22443330	EL, 33mfd, 10V
C104	22488478	EL, 0.47mfd, 50V

Symbol No.	Part No.	Description
SYNTHESIZER UNIT		
C1	22442221	EL, 220mfd, 6.3V
C2	22342103	CD, 0.01mfd, 50V, Z
C3	22361120	CD, 12pF, 50V, J
C4	22342103	CD, 0.01mfd, 50V, Z
C5	22485470	EL, 47mfd, 16V
C6, 7	22342103	CD, 0.01mfd, 50V, Z
C8	22488478	EL, 0.47mfd, 50V
C9	22371223	MY, 0.022mfd, 50V, J
C10	22488228	EL, 0.22mfd, 50V
C11	22488229	EL, 2.2mfd, 50V
C12	22371102	MY, 1000pF, 50V, J
C13	22488228	EL, 0.22mfd, 50V
C14	22485470	EL, 47mfd, 16V
C15	22342103	CD, 0.01mfd, 50V, Z
C16	22361120	CD, 12pF, 50V, J
ACCESSORY UNIT		
C1, 2, 3	22342103	CD, 0.01mfd, 50V, Z
C4	22488228	EL, 0.22mfd, 50V
C5, 6, 7	22360604	BL, 0.01mfd, 25V, M
RESISTORS All resistors are ¼W, ±5% carbon film unless otherwise noted. 1K ohm = 1000 ohm		
TUNER UNIT		
VR1	25658602	5K ohm, Semi-fixed Variable
VR2	22658604	100K ohm, Semi-fixed Variable
R1	22545104	100K ohm
R2	22545680	68 ohm
R4	22545470	47 ohm
R5	22545104	100K ohm
R6	22545333	33K ohm
R7	22545472	4.7K ohm
R8	22545102	1K ohm
R9	22545681	680 ohm
R10	22545220	22 ohm
R11	22545104	100K ohm
R12, 13	22545223	22K ohm
R14	22545223	22K ohm
R15	22545101	100 ohm
R16	22545222	2.2K ohm
R17	22545334	330K ohm
R18	22545331	330 ohm

Symbol No.	Part No.	Description
R19	22545102	1K ohm
R21	22545561	560 ohm
R22	22545100	10 ohm
R23	22545392	3.9K ohm
R24	22545331	330 ohm
R25	22545102	1K ohm
R26	22545331	330 ohm
R27	22545334	330K ohm
R28	22545333	33K ohm
R29	22545563	56K ohm
R30	22545222	2.2K ohm
R31	22545333	30K ohm
R32	22545470	47 ohm
R33	22545822	8.2K ohm
R34	22545472	4.7K ohm
R35	22545222	2.2K ohm
R36	22545473	47K ohm
R37	22545101	100 ohm
R41	22545100	10 ohm
R42	22545393	39K ohm
R43	22545333	33K ohm
R44	22545563	56K ohm
R45, 46	22545223	22K ohm
R47, 48	22545123	12K ohm
R49, 50	22545473	47K ohm
R51, 52	22545332	3.3K ohm
R53, 54	22545332	3.3K ohm
R55, 56	22545182	1.8K ohm
R57, 58	22545331	330 ohm
R59	22545333	33K ohm
R61	22545471	470 ohm
R62	22545102	1K ohm
R63	22545153	15K ohm
R66	22545104	100K ohm
R67	22545331	330 ohm
R68, 69 70	22545102	1K ohm
R71	22545332	3.3K ohm
R72	22545105	1M ohm
R73	22545564	560K ohm
R74	22545105	1M ohm
R75, 76	22545473	47K ohm
R77	22545104	100K ohm
R78	22545470	47 ohm
R79, 80	22545104	100K ohm
R81	22545221	220 ohm
R82	22545152	1.5K ohm
R83	22545221	220 ohm
R84	22545471	470 ohm
R85	22545470	47 ohm
R86	22545222	2.2K ohm
R87	22545820	82 ohm
R88	22545470	47 ohm
R89, 90	22545103	10K ohm

Symbol No.	Part No.	Description
R91	22545472	4.7K ohm
R95	22545152	1.5K ohm
R96	22545561	560 ohm
R97	22545222	2.2K ohm
R98	22545102	1K ohm
R99, 100	22545103	10K ohm
R101, 102	22545221	220 ohm
R103	22545152	1.5K ohm
R105	22545101	100 ohm
R106	22570262	100 ohm, 1W, Metal Oxide Film
R107	22570434	15 ohm, 1W, Metal Oxide Film
R108	22545223	22K ohm
R110	22545682	6.8K ohm
R111	22545333	33K ohm
R112	22545472	4.7K ohm
R113	22545153	15K ohm
R114	22545332	3.3K ohm
R115	22545104	100K ohm
R116	22545824	820K ohm
R117	22545104	100K ohm
R118	22545824	820K ohm
R119	22545823	82K ohm
R120, 121	22545473	47K ohm
R122	22545393	39K ohm
R123, 124	22545684	680K ohm
R125	22545474	470K ohm
R126	22545682	6.8K ohm
R127	22545153	15K ohm
R128, 129	22545473	47K ohm
R130	22545333	33K ohm
R131, 132	22545153	15K ohm
R133	22545103	10K ohm
R134	22545682	6.8K ohm
R135	22545563	56K ohm
R136	22545223	22K ohm
R137	22545104	100K ohm
R142, 143	22545223	22K ohm
R144	22545470	47 ohm
R146, 147 148, 149	22545223	22K ohm
R154	22545102	1K ohm
R155	22545472	4.7K ohm
R156	22545122	1.2K ohm
R157	22545472	4.7K ohm
R158	22545102	1K ohm

Symbol No.	Part No.	Description
SYNTHESIZER UNIT		
R1	22555824	820K ohm, 1/6W
R2	22555104	100K ohm
R3, 4	22584104	100K ohm, 1/6W
R5	22555104	100K ohm
R6	22555681	680 ohm
R7	22545334	330K ohm
R8	22555103	10K ohm
R9	22555122	1.2K ohm
R10	22555103	10K ohm
R11	22555472	4.7K ohm
R12	22555222	2.2K ohm
R13	22555102	1K ohm
R14	22555331	330 ohm
R15	22555271	270 ohm
R16	22555272	2.7K ohm
R17, 18	22555222	2.2K ohm
R19	22555222	2.2K ohm
R20	22545151	150 ohm
ACCESSORY UNIT		
R1	22584474	470K ohm, 1/6W
R2	22545223	22K ohm
R3	22584224	220K ohm, 1/6W
R4	22584473	47K ohm, 1/6W
R5	22584332	3.3K ohm, 1/6W
R6, 7	22584223	22K ohm, 1/6W
R8	22584223	22K ohm, 1/6W
R9, 10	22534474	470K ohm, 1/6W
R11	22584473	47K ohm, 1/6W
R12, 13	22584333	33K ohm, 1/6W
R14	22584332	3.3K ohm, 1/6W
R15	22584223	22K ohm, 1/6W
R16	22545102	1K ohm
R17	22584332	3.3K ohm, 1/6W
R18	22584223	22K ohm, 1/6W
R19	22545102	1K ohm
R20	22584332	3.3K ohm, 1/6W
R21	22584223	22K ohm, 1/6W
R22	22584682	6.8K ohm, 1/6W
R23	22584223	22K ohm, 1/6W
R24	22584103	10K ohm, 1/6W

Symbol No.	Part No.	Description
ACCESSORIES		
AC01	22903763	Owner's Manual (TE)
AC01	22903894	Owner's Manual (FR)
AC02	22124701	Antenna Feeder
AC03	22164775	Joint Cord